Claims

[c1]   1. A method for a. Analytically calculating a Target Position Report for arbitrarily many self-identifying targets in a two-dimensional grid.

[c2]   2. A system, comprising a. one Principal Application Specific Integrated Circuit Central Processing Unit that implements the said method of Claim 1. b. a set of (at least three) Surface Detection Units that send information to the said Principal Application Specific Integrated Circuit Central Processing Unit. c. a network of databases of statically stored data that the said Principal Application Specific Integrated Circuit Central Processing Unit uses to produce the said Target Position Report.

[c3]   3. A system of Claim 2, wherein said information sent from the said Surface Detection Units to the said Principal Application Specific Integrated Circuit Central Processing Unit is uniquely coded in a format that a. The said Principal Application Specific Integrated Circuit Central Processing Unit uses to identify the said communicating Surface Detection Unit. b. The said network of databases of statically stored data uses to update its data.

[c4]   4. A method of Claim 1, wherein said step of calculating said Target Position Report provides a. An Error Likelihood Ellipse. b. A Likelihood of Accuracy measure of said Target Position Report using the said Error Likelihood Ellipse.

[c5]   5. A method of Claim 1, wherein said step of calculating said Target Position Report uses a. Arrival times at a said set of Surface Detection Units. b. A Demerit System. c. Containment policies to maximize the said Likelihood of Accuracy.

[c6]   6. A system of Claim 2, wherein said Surface Detection Units are a. Physically distinct from the said Principal Application Specific Integrated Circuit Central Processing Unit. b. Coordinated to a master timing clock administered by the said Principal Application Specific Integrated Circuit Central Processing Unit. c. Optimally located to maximize the said Likelihood of Accuracy.

[c7]   7. A method of Claim 1, wherein said step of calculating said Target Position Report is a. Performed on one set of incoming data before another set of said incoming data is processed, i.e., the calculations are performed "in real time." b. Self-monitoring as to accuracy. c. Self-adjusting as to accuracy. d. Likelihood-based as to accu-

racy. e. Error bounded, in the sense that the said Likelihood of Accuracy may be made arbitrarily large by adjusting the characteristics of said set of Surface Detection Units.

[c8]   8. A method of Claim 1, wherein a. Said Target Position Reports may be calculated arbitrarily frequently. b. Said step of Claim 5 of using containment policies to maximize the said Likelihood of Accuracy is implemented analytically in the said Principal Application Specific Integrated Circuit Central Processing Unit. c. Said step of Claim 6 of optimally locating said Surface Detection Units to maximize the said Likelihood of Accuracy is implemented analytically in the said Principal Application Specific Integrated Circuit Central Processing Unit.